

**CLAIMS**

What is claimed is:

1. A method of forming a trench in a semiconductor device, comprising:
- 5 disposing a masking material on the semiconductor device;
- forming a protruding portion at a location of the trench by forming an opening in the masking material
- 10 adjacent to the location of the trench;
- depositing a semiconductor material to fill in the opening; and
- removing the protruding portion to form the trench.
- 15 2. The method of claim 1, further includes:
- providing a substrate supporting the masking material; and
- forming a first epi layer between the substrate and the masking material.
- 20 3. The method of claim 1, wherein the semiconductor material is an epitaxial material.
4. The method of claim 1, further including the step of
- 25 forming a mask at the location of the trench after disposing the masking material.
5. The method of claim 4, wherein forming the protruding portion further includes performing an etch
- 30 step to remove the masking material where the mask is absent to form the opening.

5 7. The method of claim 1, wherein depositing the semiconductor material includes using a blanket epi growth process to deposit the semiconductor material over the protruding portion and in the opening.

9. A method of forming a trench in a semiconductor device, comprising:

- providing a substrate for the semiconductor device;
- forming a first epi layer above the substrate and having a major surface;

10. The method of claim 9, further including before forming the protruding region, forming a masking material above the first epi layer.

11. The method of claim 10, further including forming a mask on the masking material at a location for the trench;

5 12. The method of claim 11, wherein the mask is a photoresist material.

13. The method of claim 11, wherein forming the protruding region further includes performing an etch  
10 step to remove the masking material where the mask is absent to form the opening.

14. The method of claim 9, wherein forming the second epi layer includes using a selective epi growth process.

15. The method of claim 9, wherein forming the second epi layer further includes forming the second epi layer over the protruding region.

16. The method of claim 15, wherein forming the second epi layer over the protruding region includes using a blanket epi growth process.

17. A method of forming a trench in a semiconductor device, comprising;

disposing a first material on the semiconductor device;

forming first and second openings in the first material to form a protruding region; and

30 disposing a second material in the first and second openings; and

removing the protruding region to form the trench.

18. The method of claim 17, further including:  
forming a substrate below the first material; and  
forming an epi layer between the substrate and the  
first material.

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19. The method of claim 17, wherein the first material  
is a masking material from a group consisting of silicon  
dioxide and silicon nitride.

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20. The method of claim 17, wherein the second material  
is an epitaxial material comprised of silicon.

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21. The method of claim 17, further including forming a  
mask on the first material after disposing the first  
material.

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22. The method of claim 21, wherein forming the first  
and second openings includes performing an etch step to  
remove the first material adjacent to the mask.

23. The method of claim 17, wherein disposing the second  
material includes using a selective epi growth process.

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24. The method of claim 17, wherein disposing the second  
material further includes disposing the second material  
over the protruding region.

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25. The method of claim 24, wherein disposing the second  
material over the protruding region includes using a  
blanket epi growth process.

26. A semiconductor device having a semiconductor material body, comprising:

an epitaxial layer disposed above the semiconductor material body;

5           a trench formed within the epitaxial layer where a  
bottom surface of the trench is aligned with an interface  
between the epitaxial layer and the semiconductor  
material body; and

a gate structure disposed within the trench to form  
10 the semiconductor device.

27. The semiconductor device of claim 26, further including:

15 a source region formed within the epitaxial layer;  
and

a p-type region adjacent to the source region in the epitaxial layer.

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Year	Value	Year	Value
1980	1.00	1980	1.00
1981	1.05	1981	1.05
1982	1.10	1982	1.10
1983	1.15	1983	1.15
1984	1.20	1984	1.20
1985	1.25	1985	1.25
1986	1.30	1986	1.30
1987	1.35	1987	1.35
1988	1.40	1988	1.40
1989	1.45	1989	1.45
1990	1.50	1990	1.50
1991	1.55	1991	1.55
1992	1.60	1992	1.60
1993	1.65	1993	1.65
1994	1.70	1994	1.70
1995	1.75	1995	1.75
1996	1.80	1996	1.80
1997	1.85	1997	1.85
1998	1.90	1998	1.90
1999	1.95	1999	1.95
2000	2.00	2000	2.00
2001	2.05	2001	2.05
2002	2.10	2002	2.10
2003	2.15	2003	2.15
2004	2.20	2004	2.20
2005	2.25	2005	2.25
2006	2.30	2006	2.30
2007	2.35	2007	2.35
2008	2.40	2008	2.40
2009	2.45	2009	2.45
2010	2.50	2010	2.50
2011	2.55	2011	2.55
2012	2.60	2012	2.60
2013	2.65	2013	2.65
2014	2.70	2014	2.70
2015	2.75	2015	2.75
2016	2.80	2016	2.80
2017	2.85	2017	2.85
2018	2.90	2018	2.90
2019	2.95	2019	2.95
2020	3.00	2020	3.00